



MISSOURI. Conservationist

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Sharing Outdoor Experiences Creates Lifetime Memories

In October, I had the privilege of being in West Plains, and I made a point to take my early morning jaunt in the neighborhood where I lived with my family for nearly 10 years. In those days, my running buddy was Belle,

my Weimaraner, and though she wasn't physically present this particular morning, she was there in spirit. This early morning brought back lots of good memories.

I have fond memories of the Weimaraners I have had over the years — Duchess, Winnie, Willie, and of course Belle. As with any bird dog owner, I have special memories of these companions and the adventures of life and times afield.

Duchess was my work buddy and hunting companion in South Dakota. One of my duties was working on Corps of Engineers land along the Missouri River. There, I spent many a day planting critical winter habitat for pheasants or managing grasslands, and most of the time Duchess was at my side. I have two favorite memories of her. One being the time she got too close to a porcupine and I had to pull out the porcupine quills with my pliers. I knew something wasn't right when she came busting out of a choke cherry thicket, close to where I was working, at a dead run, shaking her head and pawing at her nose. I knew she wanted them out of her nose in the worst way because she seemed to be in mid-air as I lowered the tailgate on the pickup for her to lie down. Surprisingly, she was relatively patient with me as I gingerly worked at pulling out the quills. The other memory was her retrieval of a wing-tipped pheasant. Hunting a piece cover, I knocked down a pheasant and it landed in a chiseled plowed field. Duchess had pointed the bird and watched the pheasant hit the ground running. Soon the gray ghost was in hot pursuit. It was a fun chase to watch as the scene unfolded across the cloddy field. As Duchess got to the bird, she put her head down to retrieve it and soon the bird and dog were



**One-year-old Philip Draper and
Bea, a 3-year-old vizsla**

tumbling head over heels. In the end, it was another pheasant in the bag and an indelible memory.

Winnie and Willie were a male and female about the same age, although from different litters. They were inseparable and constant companions of our three young children when we lived in rural Texas County, east of Raymondville. Admittedly, they were probably more pets than strictly bird dogs, but one Thanksgiving Day afield, we hunted quail and woodcock with some success. Good points and retrieves, plus tasty morsels of wild game at dinner, made that an unforgettable Thanksgiving Day.

Shared experiences in the great outdoors are priceless no matter the companion. In my life, adventures with bird dogs across all kinds of landscapes have formed unforgettable experiences. We are fortunate to live in Missouri where varied landscapes exist and where

outdoor adventures abound. I am always in constant awe of how lucky I am to live in Missouri where people care so much about their fish, forest, and wildlife resources. The ability to hike, bird watch, fish, and hunt abound across the Show-Me State. Be assured, your Conservation Department and its employees work hard each day to ensure Missourians will have these resources to enjoy today and tomorrow.

The bird dog tradition is alive and well in the Draper household. Grandson Philip just turned 1 year old, and his constant companion is Bea, the 3-year-old vizsla. It will be fun to watch and hear about the outdoor adventures of those two in the years to come.

Tom Draper, deputy director

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by Bill White, photographs by Noppadol Paothong

"Second-chance" bird dogs can enrich your life in the field and at home

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by Frank Nelson, Doreen Mengel, Andy Raedeke, and Sarah Kendrick

The Department is planning for the future so the wonder continues for generations to come

22 **Discovering Nature at Night**

story and photographs by Dan Zarlenga

Discovering nature doesn't end when the sun sets. All you need is a clear night and an open sky.

Cover: The Milky Way shines above Pickle Springs Natural Area in southeast Missouri. Photograph by Dan Zarlenga. Discover more nature photographs at night starting on Page 22.
📷 The Milky Way was photographed at 25 seconds, f/2.8, ISO 4000. The rocks and tree were a blend of six exposures at f/8, lit by light painting.

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WHAT IS IT?

Our photographers have been busy exploring the intricacies of outdoor Missouri. See if you can guess this month's natural wonder. The answer is revealed on Page 8.



JIM RATHER

BOWHUNTING

I really enjoyed the article *The Evolution of a Bowhunter* [October, Page 24]. I started bowhunting at the age of 20 and I am still at it at 69. I never hunted for a specific buck. I have always enjoyed the close encounters no matter the size of the buck. I have taken several nice bucks over the years, and I have taken a lot of smaller ones, and I still remember every one of them. Persistence is the key to being a good bowhunter.

O.L. Chastain, Fairfax

A FISH TALE

I am a mom of two boys, and have raised them hunting and fishing like my dad raised me. We love the outdoors. My youngest, Clay, just turned 12, and he has had a love for fishing all of his life. He recently caught an 8 lb., 6 oz. largemouth bass, but this is not just another big fish tale. Clay has shared his love of fishing with my 24-year-old niece, his cousin, who suffers from depression and anxiety. When Clay talked her into going fishing, she fell in love with it, expressing how much it relieved her anxiety. Now the two fish about five days a week. On the day Clay caught his big fish, his cousin caught one first, and though we didn't get an accurate weight on it, the fish looked to be about the same size. I think this is a wonderful story of how conservation has changed the life of my niece and how it could change the lives of others as well.

Christy Coffman, via email

BATS

Thank you for publishing *The Fight Against White-Nose Syndrome* [October, Page 17]. It is truly a well-written, informative, and interesting article.

Cecily Westermann, St. Louis

PERMIT PURCHASES

Is it true that starting in March 2016 I won't be able to go into a sporting goods store to buy my fishing/hunting licenses, and that they will only be able to be purchased online, meaning I'll have to print my license out or use the new MO Hunting app?

Jim Horrom, Kirkwood

Editors' Note: No, that is not true. You will have the option to purchase permits at participating locations like you have always done, but you also will have the option to purchase online or through the MO Hunting app. See Bringing Technology and Nature Together on Page 6.

MIND THE TRACKS

With hunting season upon us, I would like to bring up some railroad safety tips. While traversing the remote areas to your hunting locations, remember that trespassing on the railroad tracks and right of way is not only illegal, it is extremely dangerous. Here are a few tips: If you must cross railroad tracks, do so only at approved public crossings. If you're near a railroad track, the only safe thing to expect is that a train is headed your way. Locomotives and rail cars overhang the tracks by at least 3 feet on either side

of the rail and loose straps hanging from rail cars may extend even further. Railroad trestles and bridges are only for trains. Do not navigate to a fishing hole or hunting spot if you must trespass on a railroad trestle. Find an alternate and safe access point. For more information, visit oli.org.

John Plebanak, via email

THANK YOU

I have received this great magazine for many years. I grew up on a farm in my early years; therefore, I enjoy this type of magazine. This has been good information for our family and grandchildren. I worked many years in St. Louis at MDC/Boeing, and I still have the old farm, which is third generation. I want to thank all the people that put this great magazine together. I am retired and have returned to my roots in the country.

Conard G. Cooper, Owensville

Reader Photo



THE TURKEY, RACCOON TROT

Marc Gottfried of Defiance captured this image of turkey and raccoon prints in the Charrette Creek bed at Frank, Emma Elizabeth, and Edna Reifsnider State Forest. Gottfried took the photo while on a visit to the area with his girlfriend, Laura Montgomery. "We were hiking the river bed after a leisurely picnic on a large flat rock in the dry basin," said Gottfried. "We were looking for fossils when Laura spotted these extremely well-defined prints in the wet sand." Montgomery added, "You can almost picture the raccoon stopping to smell the scent of the turkey. We didn't get to see the animals in the fur or feathers, but it's always fun to see their tracks."



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Kids' site: XplorMo.org

Missouri Conservationist: mdc.mo.gov/conmag

Missouri Department of Conservation: mdc.mo.gov

Nature Shop: mdcnatureshop.com

Twitter: twitter.com/MDC_Online and [Nature_Videos](https://twitter.com/Nature_Videos)

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Six times a year we'll bring you eye-popping art, photos, and stories about Missouri's coolest critters, niftiest natural places, and liveliest outdoor activities. Come outside with us and XPLOR!

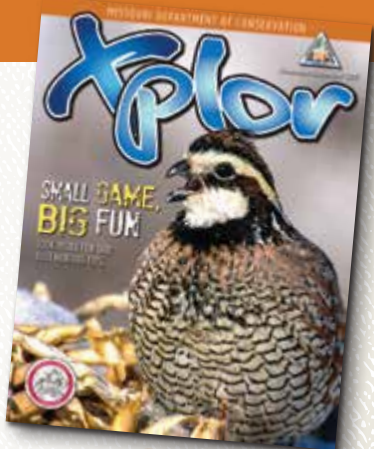
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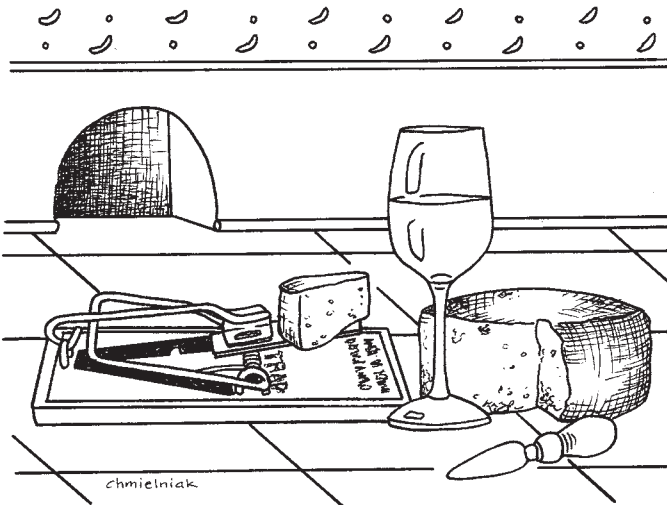
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How to catch a sophisticated mouse

Agent Notes

Pass it On Down

ONE OF MY favorite country songs is “Pass It On Down” by Alabama. More like a conservation anthem than a traditional country song, it touches on several current environmental issues and the consequences we face if changes do not occur. The chorus of the song directly challenges us all to step up and do our part:

*“So let’s leave some blue up above us
Let’s leave some green on the ground
It’s only ours to borrow, let’s save some for tomorrow
Leave it and pass it on down.”*

Hunters and anglers help do their part to “pass it on down” every time they purchase their hunting or fishing permits. In addition, federal excise taxes on firearms, ammunition, and fishing equipment help fund state wildlife agencies. Conservation groups help stretch funding and often support additional staff to help private landowners or with public land management. With the help of these organizations, thousands of acres of habitat have been restored, purchased, and managed. As a result, thousands of people each year are introduced to the outdoors through special programs for families, kids, women, and the disabled.

I challenge everyone to join a conservation organization, give back more than you take, and pass it on down.

Kevin Zielke is the conservation agent for Johnson County. If you would like to contact the agent for your county, phone your regional conservation office listed on Page 3.



HUNTING & FISHING CALENDAR

FISHING	OPEN	CLOSE
Black Bass from Ozark Streams	05/23/15	02/29/16
Nongame Fish Giggling		
Impounded Waters	02/01/15	01/31/16
Streams	09/15/15	01/31/16
Paddlefish on the Mississippi River	09/15/15	12/15/15
HUNTING	OPEN	CLOSE
Coyote (restrictions apply during April, spring turkey season, and firearms deer season)	All year	None
Crow	11/01/15	03/03/16
Deer		
Archery	11/25/15	01/15/16
Firearms		
Antlerless Portion (open areas only)	11/25/15	12/06/15
Alternative Methods Portion	12/19/15	12/29/15
Late Youth Portion	01/02/16	01/03/16
Groundhog (woodchuck)	05/11/15	12/15/15
Pheasant		
Regular	11/01/15	01/15/16
Quail		
Regular	11/01/15	01/15/16
Rabbit	10/01/15	02/15/16
Squirrel	05/23/15	02/15/16
Turkey		
Archery	11/25/15	01/15/16
Waterfowl	see the <i>Waterfowl Hunting Digest</i> or on.mo.gov/1DChcmi	
Wilson’s (common) snipe	09/01/15	12/16/15
TRAPPING	OPEN	CLOSE
Beaver and Nutria	11/15/15	03/31/16
Furbearers	11/15/15	01/31/16
Otters and Muskrats	11/15/15	02/20/16

For complete information about seasons, limits, methods, and restrictions, consult the *Wildlife Code* and the current summaries of *Missouri Hunting and Trapping Regulations* and *Missouri Fishing Regulations*, *The Spring Turkey Hunting Regulations and Information*, the *Fall Deer and Turkey Hunting Regulations and Information*, the *Waterfowl Hunting Digest*, and the *Migratory Bird Hunting Digest*. For more information, visit on.mo.gov/1Ulcnlw or permit vendors.

Operation Game Thief

Help put game thieves out of business. If you see a possible violation in progress, call your county conservation agent immediately or dial the toll-free number below:

1-800-392-1111

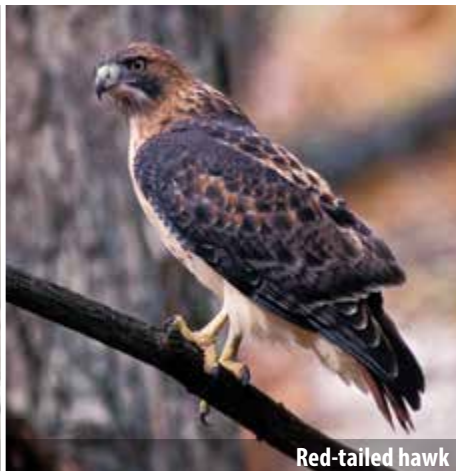
All information is kept in strict confidence. Desirable information includes names of violators, vehicle description, and license number, as well as the violation location.

Ask MDC

Address: PO Box 180, Jefferson City, MO 65102-0180
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Red-shouldered hawk



Red-tailed hawk

I have a tough time distinguishing between red-tailed and red-shouldered hawks. What is the best way to identify each species?

Twelve species of hawks, kites, vultures, osprey, and the bald eagle nest and raise their young in Missouri. Two others birds of prey only visit during the winter months. And five extremely rare species are seen only once or twice a decade.

But two of the most common species, the red-tailed hawk and the red-shouldered hawk, are sometimes hard to differentiate. When trying to make an accurate identification, consider where you saw the hawk.

Red-tailed hawks often rest atop telephone poles and other elevated perches, hunting small mammals in open fields and along roadsides. In comparison, red-shouldered hawks prefer to hunt prey — rodents, crayfish, reptiles, and amphibians — in forested areas near the rivers and streams.

Another clue is the size of the bird. Averaging 22 inches in height with a

50-inch wingspan, red-tailed hawks are larger than red-shouldered hawks, which range between 15 and 19 inches and have a 40-inch wingspan.

Seen perched from behind, red-tailed hawks have a stippling of white scapular feathers in the shape of a broad V located on the sides of the back. Red-shouldered hawks have a checkerboard of salt-and-pepper feathers on their backs, with the rusty shoulders that give them their name.

From the front, red-tailed hawks have a white chest with a band of dark streaks on its belly. Adult red-shouldered hawks have rusty bars from their bellies to their throats.

The tails also have a tale to tell.

The red-tailed hawk's name is a clue, because this raptor's tail fan is rusty-red when seen from both below and above. (The tail fan also is marked by a black band near the tip, called a sub-terminal band.) In comparison, red-shouldered hawks have black tails marked by narrow white bands.

Red-shouldered hawks also have

narrower and longer tails. And unlike a red-tailed hawk — whose wingtips extend almost the length of their tail feathers — a perched red-shouldered hawk's tail extends well beyond the tips of the folded wings.

What kind of fungi is this? It's located on a dead tree along the Perry County Community Lake hiking trail.

This fungus is commonly known as a cracked-cap polypore (*Phellinus robiniae*).

Phellinus refers to the "corky" nature of the conk, a type of mushroom, and *robiniae* means "growing on black locust trees," which is fitting since these fungi have a cork-like texture and almost always are associated with black locusts.

Johann Bruhn, University of Missouri professor emeritus, noted a black locust's heartwood — the older, nonliving interior wood of the tree — is typically highly resistant to decay.

"But *Phellinus robiniae* has evolved mechanisms to overcome this resistance," he noted. "It has found its niche in this regard."

The inedible mushroom infects the tree through wounds and dead branch stubs. Although some might lament the damage it causes the tree, Bruhn views it as part of its life cycle.

Cracked-cap polypores are perennial, increasing in size each year for up to a decade or more. When young, the conks appear velvety. The flesh tends to be reddish-brown to yellowish-brown. As they age, it's not uncommon to see cracked-caps become hosts to colonies of lichens and moss on their fissured upper surfaces.



Cracked-cap polypore



Bringing Technology and Nature Together

The Department offers a variety of mobile apps for both Android and Apple mobile devices to assist hunters, anglers, and outdoor enthusiasts.

"No matter the season or your outdoor interest, Missouri offers the resources for you and your family to get outside and enjoy," said Doug Fees, chief information officer. "And to assist you as you go out and enjoy those Missouri resources, the Missouri Department of Conservation offers user-friendly mobile applications to make your experience even better."

The MO Hunting app enables Missouri hunters, anglers, and trappers to purchase and view annual hunting, fishing, and trapping permits and associated details, as well as view permits purchased during the previous year. The app also allows deer and turkey hunters to download permits to their mobile devices, notch their permits electronically, and then Telecheck their harvest.

The Find MO Fish app allows anglers using Missouri's waterways to locate public boat ramps, as well as almost 4,000 mapped underwater structures, many placed by Department staff to improve habitat. By using the GPS technology available via their smartphones, anglers can guide their boats right to one of those brush piles, boulders, or underwater stump fields.

Learn more and download the free MO Hunting and Find MO Fish mobile apps, along with the free MO Fall Colors app, at on.mo.gov/1g8g5Ah.

Winter Trout Fishing for Everyone

The Department will stock more than 70,000 rainbow trout in 31 urban-area lakes around the state for winter trout fishing.

"Trout are typically found in the cold, spring-fed, streams of southern Missouri and the cold water of Lake Taneycomo," said Department Fisheries Programs Specialist Andrew Branson. "Stocking selected urban lakes and ponds around the state during the winter months provides close-to-home trout fishing opportunities in parts of Missouri where you normally would not find trout."

Anglers this year have more opportunities than ever. The Department is now providing trout to Giessing Lake in Farmington and

Veterans Park Lake in Fulton, in addition to previously stocked locations.

Many of these areas allow anglers to harvest trout as soon as they are stocked. Others allow harvest as early as Feb. 1. The daily limit for catch-and-keep at these locations is four trout with no length limit. All Missouri residents between the ages of 16 and 64 must have a valid fishing permit. In addition, anglers who plan to keep their catch must have a valid Missouri trout permit. Nonresidents ages 16 and older must also acquire permits.

For a list of urban-area lakes stocked for winter trout fishing, visit on.mo.gov/1k8750k.

Soaring High With Eagle Days

More than 2,000 bald eagles are typically reported around Missouri's large rivers and reservoirs during the winter, making Missouri one of the leaders in bald eagle viewing amongst the lower 48 states.

The Department offers several organized events that include live eagle programs, exhibits, activities, videos, and guides with spotting scopes to help participants see eagles perched in trees, flying, and fishing. Be sure to dress for winter weather and don't forget cameras and binoculars.

Eagle Days events are set for:

- **Dec. 5**, 9 a.m. to 4 p.m., and **Dec. 6**, 10 a.m. to 4 p.m. at Squaw Creek National Wildlife Refuge, south of Mound City. Call 816-271-3100 for more information.
- **Jan. 9**, 9 a.m. to 3:30 p.m., and **Jan. 10**, 10:30 a.m. to 3:30 p.m. at Smithville Lake Paradise Pointe Golf Course Clubhouse, north of Kansas City. Call 816-532-0174 for more information.
- **Jan. 16**, 9 a.m. to 4 p.m., and **Jan. 17**, 12:30 to 4:30 p.m. at Springfield Conservation Nature Center. Call 417-888-4237 for more information.
- **Jan. 16 and 17**, 9 a.m. to 3 p.m. at the Old Chain of Rocks Bridge, south of I-270 off Riverview Drive, St. Louis. Call 314-877-1309 for more information.
- **Jan. 23**, 10 a.m. to 2 p.m. at Runge Conservation Nature Center, Jefferson City. Call 573-526-5544 for more information.
- **Jan. 30**, 9 a.m. to 4 p.m., and **Jan. 31**, 10 a.m. to 3 p.m. at Lock and Dam 24 and Apple Shed Theater in Clarksville.

Call 660-785-2424 for more information.

- **Feb. 6**, 9 a.m. to 3 p.m. at the Schell City Community Center, downtown Schell City, and at the Schell-Osage Conservation Area. Call 417-876-5226 for more information.

Can't make an Eagle Days event? Other hot spots for winter eagle viewing include:

- Lake of the Ozarks Bagnell Dam Access, east of Bagnell
- Eagle Bluffs Conservation Area on Route K, southwest of Columbia
- Lock and Dam 20 near Canton
- Lock and Dam 25, east of Winfield
- Mingo National Wildlife Refuge, northwest of Puxico
- Riverlands Migratory Bird Sanctuary, east of West Alton
- Moses Eagle Park at Stella
- Ted Shanks Conservation Area, north of Louisiana
- Swan Lake National Wildlife Refuge, south of Sumner

- Table Rock Lake, southwest of Branson
- Truman Reservoir, west of Warsaw

Give the Gift of Nature This Holiday Season

Wondering what to get the outdoor enthusiast on your list this holiday season? Here are some ideas:

The 2016 *Natural Events Calendar* has 366 days worth of visual thrills and insights into the natural world. It's the perfect way for the outdoor lover to keep on top of when Missouri's native species bloom, hatch, migrate, etc. At \$7, it's the bargain of the year.

Paddlers on your list would appreciate a copy of the recently updated *Paddler's Guide to Missouri*. Originally researched and written by Oz Hawksley in 1965, this greatly expanded reference not only includes updated maps of Missouri's more popular Ozark streams, but also covers details of lesser-known streams and tributaries waiting to be explored. Each waterway entry includes easy-to-read maps, descriptions of access points, camping, state parks, and



CONSERVATION COMMISSION ACTIONS

The October Commission meeting featured presentations and discussions regarding a communications update, regulations committee report, Southwest Missouri quail ecology project and quail focus area update, information technology, major construction projects status report, current financial report, and the Fountain Grove Conservation Area pump station. A summary of actions taken during the Oct. 22–23 meeting for the benefit and protection of fish, forests, and wildlife, and the citizens who enjoy them includes:

- » **Recognized** Department staff members who have received recent awards.
- » **Approved** the Conservation Priorities Three-Year Strategic Plan for Fiscal Years 2017–2019.
- » **Approved** an agreement for the design of 13 radio tower replacements across the state.
- » **Approved** proposals for the fabrication of exhibit features at Runge Conservation Nature Center located in Cole County.
- » **Approved** a contract for construction of the Conservation Commission Headquarters Corridor Replacement Project located in Cole County.
- » **Approved** the designation of Mingo Natural Area in Stoddard and Wayne counties as a new Missouri Natural Area for the Missouri Natural Areas System.
- » **Approved** revisions to the Department's Hunting Incident Reporting and Investigation Policy.

The next Conservation Commission meeting is Dec. 10 and 11. For more information, visit on.mo.gov/1li700p or call your regional Conservation office (phone numbers on Page 3).

[NEWS & EVENTS]

(continued from Page 7)

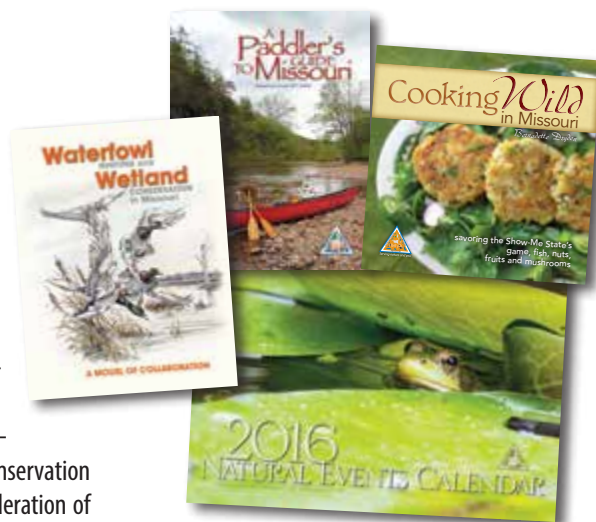
conservation areas along the way. Experienced paddlers consider the guide a handy reference to the best streams and rivers Missouri has to offer. The book retails for \$8.

Foodies on your holiday shopping list will love *Cooking Wild in Missouri*. Whether you hunt, fish, or forage, this \$15 book offers fresh ideas for turning your harvest into a mouth-watering feast. *Cooking Wild* presents more than 100 kitchen-tested recipes that will inspire beginner and advanced cooks to savor Missouri's game, fish, nuts, fruits, and mushrooms. The 200-page book also features color photographs on nearly every page and tips to make time in the kitchen easy, efficient, and fun.

Waterfowl Hunting and Wetland Conservation in Missouri introduces readers to Missouri's unique conservation heritage in a richly illustrated volume, featuring color photographs, historic black-and-white images, and reproductions of works

of art. Authored by veteran wildlife biologists and wetland managers, this 480-page coffee-table book chronicles and celebrates the state's waterfowl conservation successes, and is considered by many a must-read for serious migratory bird hunters. The book, which sells for \$40, is a cooperative effort of the Missouri Department of Conservation, Missouri Conservation Heritage Foundation, Conservation Federation of Missouri, Ducks Unlimited, Bass Pro Shops, and other conservation and hunting organizations. All net proceeds from the book's sales are dedicated to wetland and waterfowl conservation.

You can see the full selection of books, greeting cards, DVDs, CDs, and more at mdcnature-shop.com. Order online or by calling toll-free 877-521-8632. Many Nature Shop items also are available at conservation nature centers.



Need something to fill a stocking? Hunting, fishing, and trapping permits are great, affordable gifts.

At \$19, a Resident Small-Game Hunting and Fishing Permit provides a full year of outdoor fun. Giving a Nonresident Small-Game Hunting Permit (\$80) or a Nonresident Fishing Permit (\$42) encourages out-of-state family and friends to visit more often. Permits bought on Dec. 1 or later are good from the date of purchase through the following permit year, which ends on the last day of February. So, recipients get 15 months of use out of them.

The Apprentice Hunter Authorization (\$10) is an affordable gift that can create memories for a lifetime. This item is not a permit, but rather an authorization to buy hunting permits without first completing hunter education. This is a great option if you have a friend or relative intrigued by the idea of hunting, but doesn't want to invest time in hunter education to satisfy his or her curiosity. The best part is you will get to share the experience, as a person using the authorization must hunt with you or another hunter education-certified mentor.

The ultimate hunting/fishing gift is a Resident Lifetime Conservation Partner Permit. This entitles the holder to lifetime privileges associated with a Resident Hunting and Fishing Permit, Trout Permit, Migratory Bird Hunting Permit, and Conservation Order Permit. The price varies from \$70 to \$800, depending on the recipient's age. Resident Lifetime Fishing Permits are also available.

Regular permits are available from vendors statewide or online at bit.ly/1Wln6vm. Lifetime permits are available at on.mo.gov/1SbV84M or by calling 573-522-4115, ext. 3574.



WHAT IS IT?

Ozark Sculpin | *Cottus hypselurus*

The Ozark sculpin is one of at least 14 fish species that are endemic to the Ozark Region of southern Missouri and Arkansas, meaning they occur nowhere else in the world. It requires coldwater habitats, occurring almost exclusively in branches and streams that receive much of their flow from springs. It is found in riffles as well as pools, over bottom types ranging from silt to gravel and rock. It hugs the bottom of these streams, lying motionless and blending in with its surroundings in order to escape detection from predators and ambush its prey. Its diet includes the immature stages of aquatic insects (stoneflies, mayflies, midges, black flies, and caddisflies), snails, and small fish, including other Ozark sculpins. —photograph by Jim Rathert

Salvation Army Embraces Discover Nature — Fishing Program

The Department's Discover Nature — Fishing program is poised for a nationwide launch, thanks to The Salvation Army Central Territory, which has adopted the curriculum for its children's outdoor programming.

The Discover Nature — Fishing program provides free, hands-on fishing instruction designed to help people of all ages gain the skills and confidence to go fishing on their own. The program is divided into four lessons. Participants learn about fishing equipment, casting, rigging a fishing rod, baiting a hook, and proper handling of fish. The course also covers fish identification, fish habitat, fishing with lures, and how to stock a basic tackle box.

Jerrie Miller, director of character building for the Salvation Army's central territory, said Missouri's program was the perfect balance between too much detail and not enough.

"We wanted a curriculum that was easy to understand, yet still contained enough content to cover what kids need to know," she said, "and the Missouri Department of Conservation has a curriculum that makes it easy to adjust for different age groups."

Miller noted many of the children who attend the Salvation Army's camp programs — the organization operates 43 camps nationwide — live in cities and have limited access to nature. Often adult volunteers aren't well-versed in outdoor skills, either.

Teaching fishing made sense, she said, since all of the Salvation Army's camps have access to water.

"We want to get kids outside to discover and explore nature," Miller said. "We want them to appreciate the beauty and embrace conservation stewardship."

The Department is providing the curriculum and training for the instructors, a service it already provides to other volunteer educators across Missouri.

The first training session for volunteer instructors was held in mid-October. A second training session is slated for May, Miller noted. The Salvation Army hopes to implement the new program at its 2016 National Jamboree in Steelville next summer.

"We are excited to partner with the Salvation

DID YOU KNOW?

Conservation pays by enriching our economy and quality of life

MDC County Assistance Payments

- » **\$1,612,506 was paid to Missouri counties** for levee and drainage district taxes, forest cropland payments, payments in lieu of real estate taxes, and county aid road-trust payments last fiscal year.
- » **MDC makes payments** in lieu of real estate taxes on land as long as we hold the land in public trust. Payments are no less than at the time of acquisition.
- » **\$20.8 million has been paid** to Missouri counties in lieu of real estate taxes since 1980.
- » **The county aid road-trust program** is designed to support maintenance of roads accessing Department areas. This program enables MDC to cost-share roadway maintenance with counties and other local area governments throughout the state. Cost-share is usually 50 percent with a county's match being in-kind services.
- » **About \$530,000 is provided annually statewide** through the county aid road-trust program.

Army and help teach fishing to Missourians. Discover Nature — Fishing is a quality program developed by the Department. It's nice to know that our efforts are being recognized and used by others," said Fisheries Division Chief Brian Canaday.

MoNASP Targets Success

The Missouri National Archery in the Schools Program, or MoNASP, is exploring a new dimension — the third dimension — next year.

With the addition of 3-D targets, organizers hope to encourage students to view bowhunting as an enjoyable and rewarding outdoor activity — one they may want to try themselves.

The new 3-D targets take the shape of six game species: deer, turkey, bear, coyote, sheep, and antelope.

The first statewide tournament with a 3-D category is scheduled for April 2 at Helias High School in Jefferson City. The tournament is an addition to, not a replacement of, traditional target shooting, said Education Programs/Curriculum Supervisor Kevin Lohraff.

Currently, 535 schools around the state offer MoNASP programs. Archery is usually taught in physical education courses, but science, math, history, and even English courses have included it, too.

The sport has proved to be so popular that nearly half the schools have started after-school archery clubs.

"MoNASP helps build stronger, more confident, and accomplished kids," said Eric Edwards, MoNASP program coordinator for the Department. "Nearly everyone can succeed at archery. Kids love it. And statistics show that archery helps improve school attendance, boosts self-esteem, and increases physical activity."

The Department, in conjunction with the Conservation Federation of Missouri, supports MoNASP by offering schools a \$1,500 rebate for equipment purchases. In exchange, school districts agree to teach archery skills for at least two weeks, two school years in a row.

Growing the MoNASP program continues to be a Department goal, said Edwards.

"A lot of schools think they are too small, or don't have the funds," he said. "But the program is so simple that all schools have the ability to participate. It only takes one person to get the ball rolling."

To learn more about how your school can participate, contact Edwards at 573-522-4115, ext. 3295 or via email at eric.edwards@mdc.mo.gov. To learn more about the MoNASP program, visit on.mo.gov/1Wlrz0L.



SPORTING-DOG RESCUE

**“Second-chance” bird dogs can enrich
your life in the field and at home**

BY BILL WHITE
PHOTOGRAPHS BY NOPPADOL PAOTHONG



A rescued German
shorthair (foreground)
joins a breeder-raised
English pointer on a hunt.

W

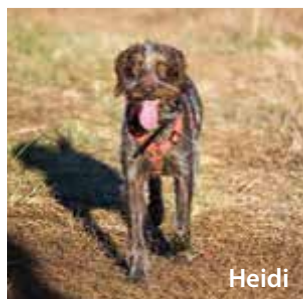
WE SHOT A PHEASANT A FEW YARDS AWAY FROM a cattail-rimmed wetland and marked the spot where it fell. The dogs raced ahead, but my 9-year-old German wire-haired pointer, Heidi, cut away and splashed into the water. We kicked the grass for the missing bird. Boy, was I mad! Here we were, looking for the pheasant, and my retriever was out playing in the water! Imagine my shock and then pride when she came up looking like a drowned rat with the just-as-wet rooster in her mouth. Probably the most heroic retrieve I ever misjudged from a dog who DID NOT like to get wet. I was reminded that day to trust her instinct. I hugged Heidi so long that I got wet, too.

Dogs Play a Conservation Role

Most bird dog hunters don't think of their dog as a key tool in the conservation and careful use of game birds. But bird dogs play a vital role in finding downed or crippled birds that might otherwise be wasted. I typically forget about the conservation side because, for me, hunting is all about watching the dog. From that first hunt where the dog gets it and turns into a bird machine, to those later years in a dog's life when I know what to expect, I am always amazed at sporting dogs' abilities, instinct, and drive, just like I witnessed in Heidi that day.

Back then, we didn't even know Heidi was a "rescue dog." Not sure I had ever heard of a

**The author
hunts quail
with his
rescue dog,
Trapper.**



Heidi

More Places to Hunt, Fish, and Train Your Dog

The Department is launching a new program in July 2016 that cost-shares with landowners to improve Missouri's fish, forest, and wildlife habitat and also compensates them for allowing public hunting and fishing access. The Missouri Recreational Access Program (MRAP) is modeled after similar efforts in neighboring states and seeks to provide additional hunting and fishing opportunities for Missourians in high-quality habitats. MRAP will use a \$1.1 million grant through USDA's Voluntary Public Access and Habitat Incentive Program, along with Department funding to support this effort. Visit mdc.mo.gov/hunting or mdc.mo.gov/fishing for maps showing the locations open for public access next fall.

rescue dog, either! Dogs like Heidi are rescued from possible euthanasia at an animal shelter, or they are accepted from owners who no longer want or can care for them.

Benefits of Adoption

It wasn't until the last several years, when both my younger sons got their own rescue bird dogs, that I saw the benefits of adopting a sporting dog. All three of the current bird dogs in our family are from rescue situations, their adoptions a result of referrals from a long-time friend and bird dog owner, Elsa Gallagher. Four of Elsa's 11 dogs are rescue dogs, too.

The dogs available for adoption through rescue come from several different sources. Some are found in animal shelters. Some are turned over to various rescue programs because of a change in family circumstances such as a divorce or job transfer, or because the owners were not prepared for the energy level of a young bird dog. If you go online, you can find rescue dog sites for most breeds of dogs. The rescue dogs and potential owners are carefully evaluated to ensure the best possible placement for each dog. Rescue organizations typically charge a reasonable fee for neutering and other expenses.

For me, the biggest benefit of adopting a rescue dog is training and maturity. Between work and family, I don't have time for a puppy. Most rescue dogs will be at least 1 year old. If you look hard enough, you can usually find a rescue dog that



One benefit of adopting a rescue dog is the established training and maturity, as most rescue dogs are at least 1 year old. Elsa Gallagher trains rescue dogs and works to find homes for them.

has had some training, or it may even be fully trained. For example, Heidi's original owner had fully trained and hunted her. The problem was she wasn't compatible in the field with the owner's long-ranging pointers, so she didn't get to see much action. Just a little finish training and she was good to go when she turned two. Those, like Elsa, who work with finding homes for rescue dogs, probably put it best: "Why get a puppy when there are plenty of good older dogs out there needing a good home?"

As with anything else in life, adopting a sporting dog is not always easy. You won't know until you get the dog if there are behavior and health problems or gun-shyness. But I could make the same case about getting a new puppy. My current rescue dog, Trapper, was a little gun-shy, and he spent a couple of weeks with a professional trainer to overcome the issue.



I think a rescue dog was best for my son Andrew. He is single, has a full-time job, and really didn't have time or enough hands to handle an energetic puppy. His Deutsch-drahthaar, Chief, was at least 18 months when they met for the first time. All Chief needed was a little training to get him ready for hunting. Chief has plenty of natural instinct, great pointing style, and a superior nose. He typically out-points other dogs



Caleb Smith turned his rabbit-hunting activities into a yearlong FFA project.

Beagle-Training Project Helps FFA Student Bridge the Gap Between Wildlife and Agriculture

by Kristie Hilgedick

"Get in there! Look! Look!" the young hunter shouted. A small pack of beagles raced out of sight, but not out of earshot. It wasn't long before the telltale baying announced they've found a fresh rabbit trail.

"Everyone wants a fast dog, but also a good track dog," explained 16-year-old Caleb Smith of Hartville. "It's hard to find those qualities."

Born into a family that reveres outdoor traditions, Smith started hunting rabbits competitively at age 13. He's already seen success beyond his years, earning the Grand Prize and the Hound of the Hunt title at the Winter Classic Field Trial held in southern Osage County last year.

Beagles hunt for the joy of the pursuit, but Smith's efforts are sweetened by the trophies and prizes he's earned. As many participants know, outdoor sports can be expensive. Purebred canines, kennels, feed, and equipment all come at a cost.

This year the pastime morphed into something new for Smith. At Hartville High School, Smith turned his rabbit-hunting activities into a yearlong FFA project. While many of his peers will be raising prize steers and hogs, Smith will be cultivating prize beagles. As part of his project, Smith is recording the expenses he incurs and the profits he takes in.

Hartville Agriculture Instructor and FFA Advisor Doug Glenn approved the project, which bridges the gap between the use of ground for wildlife and the school's agricultural program.

"Having an alternative approach works really well," Glenn said. "We have so many students who want to be involved in FFA, but don't come

from traditional farm families."

Another plus, said Glenn, is the low cost of entry, especially when compared with the expense of purchasing a large purebred animal and having the resources to raise it. He noted that rescued hunting dogs could be good candidates for FFA students like Smith who want to explore the connections between wildlife management and agriculture. "And it teaches the same responsibilities and life lessons we want to instill," Glenn added.

With his standard-issue ball cap and shades, camouflage shirt and Wrangler jeans, Smith fits the definition of a country boy. He said the time he spends training and competing "keeps me out of trouble." Smith chalked up his winning streak to luck, even though many of his competitors have decades' more experience.

Red Oak Beagle Club Secretary Mike Ridenhour said the teen was being modest. "You have to be able to call your dogs, recognize their voices, and know the rules," Ridenhour said. "It's not entirely luck."

Smith said it doesn't matter to him if he wins or loses.

"I've beaten some of them, and they've beaten me. It's how it plays out," he said. "Although I like the adrenaline rush of competition, it's peaceful hunting on my own. I like to listen to them run. I find it kind of calming."

Kristie Hilgedick serves on the Department of Conservation's communications team. She enjoys traveling to new places and spending time outdoors.

and is able to find coveys and downed birds alike. On top of that, he is a great house pet for Andrew.

My youngest son, Tony, was still living at home when he adopted his Hungarian vizsla, Jake. The puppy was just 16 weeks old, and the breeder couldn't get him sold. He told Tony that he wanted to help a young man get started with hunting gamebirds and gave him the puppy. This worked great since Tony, Andrew, or I could help care for, train, and exercise the dog. A vizsla was a great first dog since the breed is loyal, obedient, and known to make great pets. Vizslas were bred in Hungary to hunt for royalty several hundred years ago. While Tony may not be royalty, Jake certainly thinks he is.

Training for Both Dog and Owner is Important

Both Tony and Andrew got plenty of help from experienced bird dog owners. Most gratifying was help and advice from professional kennels. With their help, we learned that the key to training a bird dog is daily repetition of each lesson until the dog performs the desired behavior automatically. For example, my German shorthair, Trapper, had the natural abilities of pointing and retrieving, but he had problems when I wanted him to give me the quail he had so proudly retrieved. He wanted to play, which is typical of a young bird dog. So we spent about 10 to 15 minutes every night for more than a month learning the method of force-fetching. This is a process of making a dog completely reliable in its bird retrieving and delivery, turning play into obedience.



The author trained Trapper every day for a month through the method of force-fetching.



To start this training method, you must persuade a dog to accept a training dummy when he doesn't want to. Getting him to open his mouth is the hardest part, but it just takes repetition — no matter how many times he turns his head. You don't have to be a dog whisperer to do this. Some kennels and other commercial providers produce and offer excellent training videos right here in Missouri, and you can find plenty online to teach you all you need to know to train a bird dog.

Usually training a dog teaches me a thing or two, too. Each new dog I get and train just seems to do better than the one before. I like to think that we actually train each other.

The secret is getting these dogs on plenty of birds during the hunting season, whether quail in Missouri or pheasants and grouse in other states. In Missouri, you have to travel to areas of the state where quail are doing well, such as Missouri Department of Conservation quail emphasis areas. Or you can find a local gamebird farm that specializes in releasing pen-reared birds for hunts on fields managed for bird habitat.

No offense to my human friends, but I have never hunted with anyone who had the natural instincts, drive to hunt, or such amazing abilities as my bird dogs. Give a rescue dog a chance to fulfill its true purpose. It can be a friend, house pet, hunting companion, and the gateway to the sport of bird hunting. Adopt one, and a whole new adventure awaits you. ▲

Bill White is the Department's Private Land Services division chief. While he is not spending time with Trapper, he enjoys hunting, fishing, and camping with his family.

The author and his sons, Tony (left) and Andrew (right), work with their bird dogs Jake, Trapper, and Chief. The key to training is daily repetition of each lesson until the dog performs the desired behavior automatically.





The Department is
planning for the future
so the wonder continues
for generations to come

Wondrous Wetlands

BY FRANK NELSON, DOREEN MENGEL,
ANDY RAEDEKE, AND SARAH KENDRICK

WETLANDS HAVE A UNIQUE BEAUTY AND ARE RICH HABITATS that support birds, amphibians, reptiles, mammals, and fish year-round. This makes wetlands very attractive to people, especially those who are interested in hunting, birding, wildlife watching, angling, nature photography, or hiking. It's no wonder many of our state's most visited conservation areas are wetlands. Even people who don't visit wetlands regularly benefit from their ecosystem functions. Wetlands work to clean our water, reduce flood damage, decrease the severity of droughts by slowly releasing water, cycle nutrients through our environment, and provide habitat for countless plants and animals each year.

To ensure these vital habitats remain for Missouri's future generations, the Department is undertaking a new Wetland Planning Initiative. This effort will help chart the course for wetland management on Department-owned wetlands and help other wetland managers capitalize on new opportunities for partnership.

Colors of the prism break across the waters of
flooded timber at Mingo National Wildlife Refuge.



Mallards on a snow-covered moist soil management unit

Where We've Been

The Department's first wetland plan was written in 1989. In the world of wetlands and waterfowl, 1989 was a time of grave concern. Long-term drought and habitat loss had contributed to sharply declining waterfowl populations, with the lowest breeding population recorded since the mid-1960s. Older duck hunters may remember these lean years when the waterfowl season length and daily bag limit dipped to 30 days and three birds, respectively.

Concerns about habitat loss and declining bird numbers translated into action. The Department developed an ambitious plan that placed emphasis on acquiring and/or developing 68,000 acres of public wetlands. The Wetland Plan also recognized that wetland losses could not be adequately addressed without contributions from partnerships with private landowners. Therefore, the plan proposed working with willing landowners to improve management on 39,000 acres of existing wetlands and to develop an additional 12,500 acres of

Missouri wetlands are diverse and can be forested, wet prairies, open marsh, or somewhere in between.

private wetlands. It was a bold plan, but the biologists at the time felt that drastic times called for drastic measures.

Fast-forward 26 years to today and think about your favorite wetland conservation area. Is it Bob Brown, Four Rivers, Eagle Bluffs, Grand Pass, Nodaway Valley, Otter Slough, or Ten Mile Pond? Perhaps you enjoy some of the older wetland areas like Fountain Grove, Ted Shanks, and Duck Creek? All of these areas owe either their existence or expansion to the 1989 Wetland Plan.

Private landowners also reaped the benefits. The plan laid the groundwork for the Department's partnership with USDA Natural Resource Conservation Service. Regional teams were established, bringing expertise in biology, soils, and engineering together to focus on putting wetland conservation on private land. Today, these teams have assisted landowners in



Swallowtail butterfly on a pickerelweed flower



An emergent marsh on
B.K. Leach Conservation Area



Bottomland hardwood forest at
Mingo National Wildlife Refuge

successfully restoring more than 150,000 acres of private wetlands across Missouri.

The investment in public and private wetlands has paid off, particularly for waterfowl and other migratory birds. Missouri now experiences nearly twice as much duck use in the fall as during the last period of peak populations in the 1970s and over four times as much as during the dismal years of the 1980s. Additionally, Missouri's mosaic of private and public wetlands are recognized as continentally significant for the role they play during migration for a range of migratory birds. In fact, many of the new wetlands developed since 1989 are designated as Important Bird Areas by the National Audubon Society.

Today's Challenges and Opportunities

There is no doubt the status of wetlands in Missouri has improved. While changing times have brought new opportunities, we also face new challenges.

Changing Social Times

Today's life events and activities compete with outdoor pursuits and connecting with nature. Just think of the changes in how we communicate with one another. The traditional landline phone has been replaced by smart



Marbled salamander

The Benefits of Wetlands

Whether you enjoy the serene views of water, plants, and sky from the edge of a boardwalk or you prefer a more immersive experience of trudging through the muck and mire in pursuit of good memories and sport, wetlands are important to a wide range of Missourians across the state. Wetlands support myriad lifeforms, including plants, birds, mammals, reptiles, amphibians, insects, and fish. The great views and incredible productivity illustrate why wetlands matter.

What isn't apparent, but always in the background, is the slow, systematic cycling of water and nutrients. The seasonal ebb and flow of flooding and drying is tied to processes of decay and growth. Wetlands serve as natural filters and contribute to clean air, water, and healthy soils. During wet periods, wetlands act as natural buffers that reduce flood damage by acting as sponges, sopping up overflow along our active waterways. During drought, wetlands work to relieve parched water levels in surrounding lands by slowly releasing moisture to counterbalance low water tables and slow stream flows. Despite the hidden nature of these services, they play a crucial role in contributing to our civilization and quality of life.

phones, email, texts, video conferencing, and social media. Not to mention all of the political, economic, and demographic changes that have also occurred. Even typical family life is drastically different — juggling work, school, and extracurricular activities leaves little time to get out and experience nature.

Natural places, like wetlands, need people to value them for fish and wildlife, but we also need outdoor spaces to contribute to our quality of life. This sentiment represents a bit of a shift from traditional conservation efforts, emphasizing a human element in the fields of natural resources and conservation.

Water Demands

Another of today's challenges is how to handle water demands and extreme weather events. Stifling droughts and unprecedented floods make water use a trending topic. Growing demands for water from all walks of life, including industry, agriculture, communities, and conservation, require working together to balance local and regional water budgets. While these are not easy discussions, they are critical. Wetlands regularly shift from wet to dry periods, so they are well suited to help surrounding lands during periods of extreme weather. Wetlands soak up excess water during floods, they serve as a filter to improve water quality, and add to ground water supplies and local streams during droughts.



The new Wetland Planning Initiative aims to ensure wetlands are conserved to nurture a wide range of public recreation, such as waterfowl hunting, wildlife viewing, frogging, and discovering nature.



Technology

New tools have also been developed to assist wetland conservation. In wetlands, a few inches of water can make all the difference in determining which plants will grow, and thus, which species of wildlife will benefit. New technologies allow wetland managers to use water more efficiently to provide water depths needed by different plants and animals. In the past, biologists used basic contour maps that showed differences of a foot in elevation across the landscape. Today, computer mapping software and digital elevation data provide biologists with three-dimensional perspectives that enable them to understand elevation changes as small as a tenth of a foot.

Connecting the Pieces

Most of Missouri's larger wetlands now exist within a complex of public and private wetlands, but still are managed

relatively independently of one another. Much like a jigsaw puzzle, we have the potential to fit together all of these different pieces through better coordination and collaboration with partnering agencies, organizations, and individuals so that wetland complexes can provide greater benefits and function as ecological hubs for local and migratory wildlife.

A New Wetland Initiative

To build upon the success of the 1989 Wetland Plan, as well as meet today's challenges and opportunities, the Department has launched a new Wetland Planning Initiative. The initiative is driven by a holistic philosophy that links the natural world with human interactions by outlining two intertwined sets of ecological and social goals. Ecological goals acknowledge the ties between land and water that impact the health of our



Starhead topminnow

DUCK HUNT: NOPPADOL PAOTHONG; STARHEAD TOPMINNOW: FRANK NELSON; FROGGING, KIDS AT NATURE CENTER, AND MUSHROOM HUNT: DAVID STONNER



Private landowners meet with Department of Conservation staff at a wetland field day. Partner and stakeholder open houses and workshops will be held in the near future to gather input for improving the beneficial connections between wetlands and the public.

wetlands and the plants and animals using these habitats. The social goals focus on strong partnerships that must work together to pass on care and concern for the outdoors to a new generation. The success of wetland conservation in Missouri cannot be accomplished by the Department alone and will depend on strong partnerships with those who appreciate the benefits and beauty wetlands provide.

The Wetland Planning Initiative aims to ensure wetlands are conserved to benefit a diversity of plants and animals, nurture a wide range of public recreation, and support additional benefits to society. The plan has two portions. The Wetland Strategic Guidance Document describes the Department's philosophy for future wetland conservation. The second document, the Wetland Implementation Plan, serves two purposes. It will be the Department's guide to wetland management and conservation activities on our public areas. This document also serves as an invitation to partners for participation in wetland conservation issues of mutual interest.

A New Era for Wetland Conservation

The new Wetland Planning Initiative is being developed and will take time to shape. Partner and stakeholder open houses and workshops will be held in the near future to gather information for improving the beneficial connections between wetlands and the public. The potential for continued wetland conservation in Missouri is



Wood ducks

Wetland Reserve Enhancement Program Grant provides opportunity for partnerships

There are many ways to partner with individuals and agencies to move wetland conservation forward. Here is another great example of how wetland habitat in Missouri is being conserved and improved for future generations. Earlier this fall, the Department received a grant for \$2.4 million from the U.S. Department of Agriculture's Wetland Reserve Enhancement Program (WREP) to help protect and enhance wetland habitats on existing Wetlands Reserve Program (WRP) easements. The Department, in cooperation with Ducks Unlimited, will provide an additional \$700,000 in matching funds, bringing the total investment in wetland restoration to \$3.1 million over the next three years. These funds will provide financial assistance to eligible landowners interested in restoring the hydrology and improving the wildlife habitat on older WRP wetlands in ways that better mimics natural systems. The goal is to promote wetlands with diverse water levels and vegetation that provide wildlife habitat for a larger suite of wetland dependent species, including ducks, geese, and shorebirds. Missouri landowners may apply for the new WREP this winter. Contact your local private lands conservationist to apply, or visit on.mo.gov/1GZb0B4.

great. Just look at how much our state accomplished in the past 26 years for wetlands and the fish and wildlife that depend on these integral habitats. By incorporating the link between nature and society and working to strengthen wetland partnerships, Missouri wetlands will continue to be enticing to the public for outdoor activity and sanctuaries of solace. It is an exciting time, and as the new Wetland Planning Initiative takes flight, we hope to see or hear from you along the way. ▲


Frank Nelson is a wetland ecologist who enjoys mucking around in the swamp no matter what the season and sharing the importance of the outdoors with his kids. He works out of the Big Rivers and Wetlands Field Station in southeast Missouri. **Doreen Mengel** is a wetland/waterbird ecologist who is happiest traipsing through wetlands with her Labrador retriever looking for amphibians and other wetland critters. She works out of the Central Regional Office and Conservation Research Center in Columbia. **Andy Raedeke** is a wetland/waterfowl ecologist who can't think of a better way to spend an early December morning than being out in the marsh looking out over decoys. He works out of the Central Regional Office and Conservation Research Center in Columbia. **Sarah Kendrick** is the outreach and marketing supervisor in Wildlife Division and loves to visit wetlands to bird-watch and waterfowl hunt.

A night photograph of a rocky landscape. The foreground and middle ground are filled with large, dark, jagged rocks. Some small green plants are growing between the rocks. In the background, there are dark silhouettes of trees. The sky is dark and filled with many stars, creating a starry night effect.

Discovering Nature at Night

Discovering nature doesn't end when the sun sets. All you need is a clear night and an open sky.

STORY AND PHOTOGRAPHS BY DAN ZARLENGA

A composite image showing a rocky river at twilight. The foreground is filled with large, dark, textured rocks. A small stream flows through the rocks on the left. The background is a dense forest of evergreen trees. The sky is a deep twilight blue, filled with numerous stars and constellations, indicating a long-exposure photograph. The overall scene is serene and natural.

**Stars over Castor River Shut-ins Natural Area,
Amidon Memorial Conservation Area**
Post-production blending allows for
combining stars with a larger landscape
beyond the range of typical lighting
devices. The foreground was shot in two
minutes at f/11, ISO 100, taken during
twilight. The background star field was
created in 30 seconds at f/2.8, ISO 2000.

T

THE STARS ABOVE ARE AS MUCH A part of nature as the soil beneath our feet, the flowers at our sides, or the trees that tower around us. The moon and stars have been sentinels watching over our world from the beginning of life on Earth. Nearly every living thing in nature we see, study, and appreciate has been reared under their influence.

Science confirms many animals, from warblers to seals to dung beetles, rely on the stars to find their way. They surely learned the trick long before humans did. The movements of the sun, moon, and stars form cycles we and other living things use to keep time every day.

I have been fascinated with the wonder of the night sky ever since I can remember. Looking up at the infinite sparkles in a truly dark sky never ceases to captivate me. Each speck of light is a distant sun, like our own. Ancient people spent countless nights marveling at these lights. They used their imaginations to connect the celestial dots to create patterns of mythical figures and everyday things. These became the basis of the constellations we still recognize today.

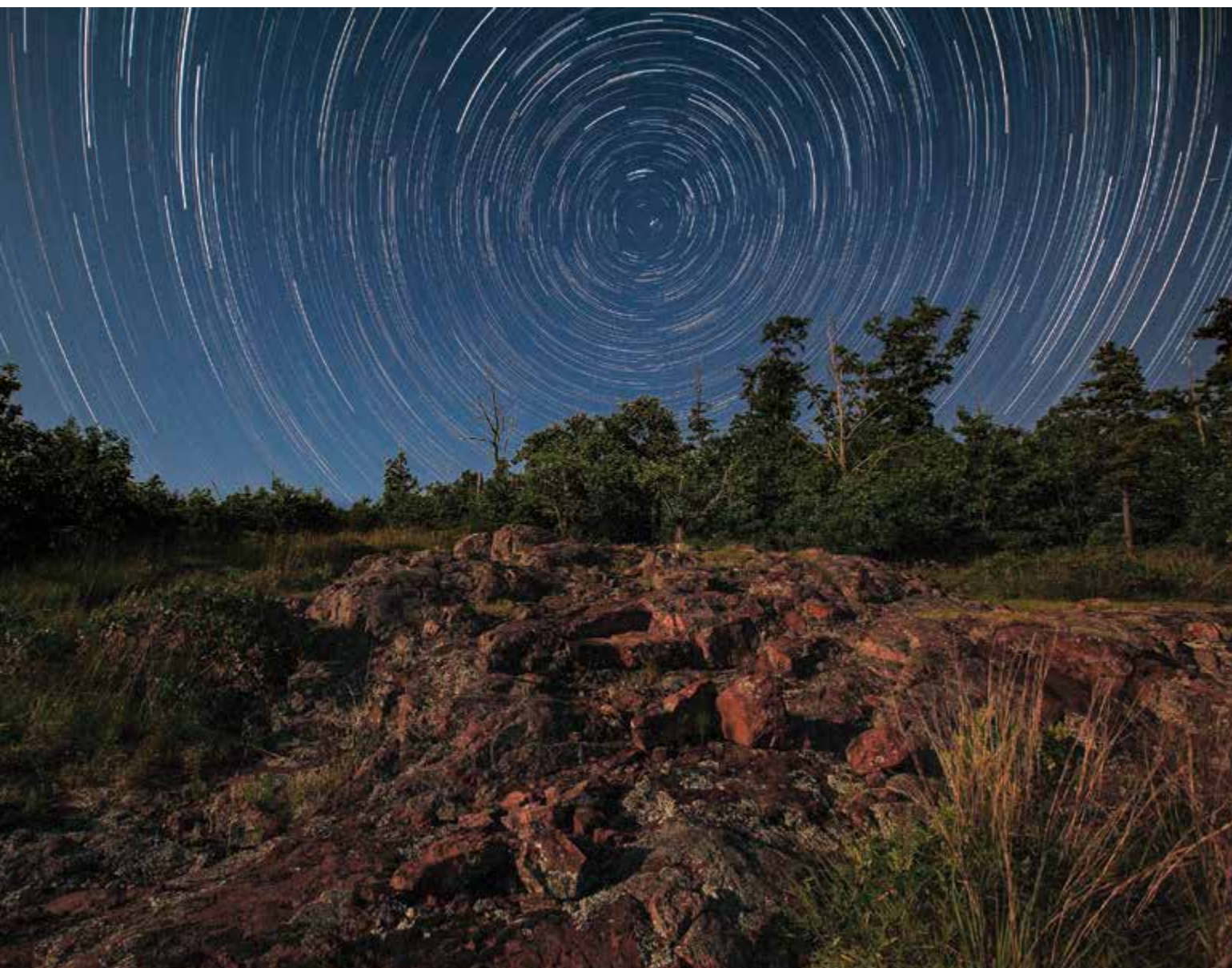
As you become more familiar with the night sky, you will notice that the star patterns move during the night and through the year with the predictability and precision of a Swiss watch. Starlight travels at



**Victoria Glades Star Trail,
Victoria Glades Conservation Area**

The idea of mixing star trails and flowers intrigues me. The trick is to find a still night to avoid the effects of wind during long exposures. The foreground was shot 30 seconds at f/16, ISO 400, a blend of two light-painted images. The background star trails were created from a stack of 63 images, 60 seconds each, f/5.6, ISO 800.





Circumpolar Stars on Proffit Mountain, St. Francois Mountains Natural Area
Proffit Mountain is an ideal place to camp after a 7-mile backpack trip. This was created from a stack of 64 images, 120 seconds each, f/5.6, ISO 1000. The moon lit the foreground. This exposure value offered a good balance of stars and foreground brightness.



Light Dome of Farmington, Pickle Springs Natural Area
Finding a truly dark sky free of artificial lights is a stargazer's biggest challenge. This image was created from separate exposures for the background sky, fading twilight on the hills, several shots of the rock formations lit by an off-camera flash, and a self-portrait.

a finite speed, about 180,000 miles per second or 6 trillion miles per year. That may seem fast, but due to the vast distances in the universe, the light reaching our eyes could have started on its way four years, or thousands of years, before. When we look at the stars, we are looking back in time.

You can come to depend on the stars' movement to mark the changing seasons just as the ancients did. The prominent constellation Orion riding high in the southern sky signals the coming of winter as much as the first snow. Leo the Lion heralds in spring right along with the first flowers on the forest floor. The Milky Way shimmering overhead speaks to the warm nights of summer as decidedly as the calls of the crickets and katydids. And the Great Square of Pegasus always presides over autumn's changing colors.

Conservation areas located away from city lights can be excellent venues for stargazing. Many are open until 10 p.m., and it may be possible to contact an area manager to obtain a special use permit for nighttime viewing during other times.

Appreciating the stars and night sky doesn't require expensive equipment. A blanket or sleeping bag spread on the ground can be a nice viewing location. A reclining outdoor lounge or camping chair is another option if you prefer to do your viewing off the ground. A pair of binoculars — perhaps ones you may already own — can offer a wondrous window on the universe. An ideal pair would be in the 7X50 or 10X50 range, but almost any will offer an enhanced view and allow you to see more stars than the naked eye.

A planisphere is an excellent tool to aid in learning the stars and constellations. This simple device consists of a rotating dial used to set





Photographing the Night

Photographing night scenes is best done with a digital single-lens reflex (DSLR) and a tripod because of the long exposures. To photograph a basic star field, using a shutter speed of 20–30 seconds, ISO 1600 at f/3.5–2.8 will do the trick. For a detailed shot of the Milky Way, use an f/2.8 lens and ISO 3200.

Star trails require stacking multiple exposures, usually 30–60 seconds each, taken continuously over several minutes or hours. A programmable remote timer makes this possible. The individual images are stacked later with software to create the continuous streaks as the stars move over time. Pointing toward Polaris, the north star, creates the concentric circles.

I often shoot my scenes in layers. I begin with the “base” layer, which is usually the sky component using the methods above. I then set my camera to a lower ISO, smaller aperture for depth of field, and refocus on the foreground. I shoot a series of images and use various lighting tools to individually “paint” different portions of the scene. Afterward all these layers are blended together in Photoshop to create the final image.

Although many of my images are assembled after shooting, everything you see was really there — nothing other than light has been added. Creating images this way allows me to capture each element at its best exposure and focus.



Lunar Eclipse, Tower Rock Natural Area

The 30 seconds at f/4, ISO 2000 required for this scene left an over-exposed moon. I reshoot the moon a few minutes later at 280mm, 1.3 seconds, f/5.6, ISO 6400. I then resized it in Photoshop, fitting it exactly over the original moon. Passing river traffic lit the rock face.

Star Trails, Danville Conservation Area

This was created from a stack of 38 images, 60-seconds each, f/4, ISO 1000. The moon offered perfect illumination for the scene. Unlike the old-school film method of one continuous exposure, digitally stacking multiple, shorter exposures permits taking star trail images without having perfectly dark skies.

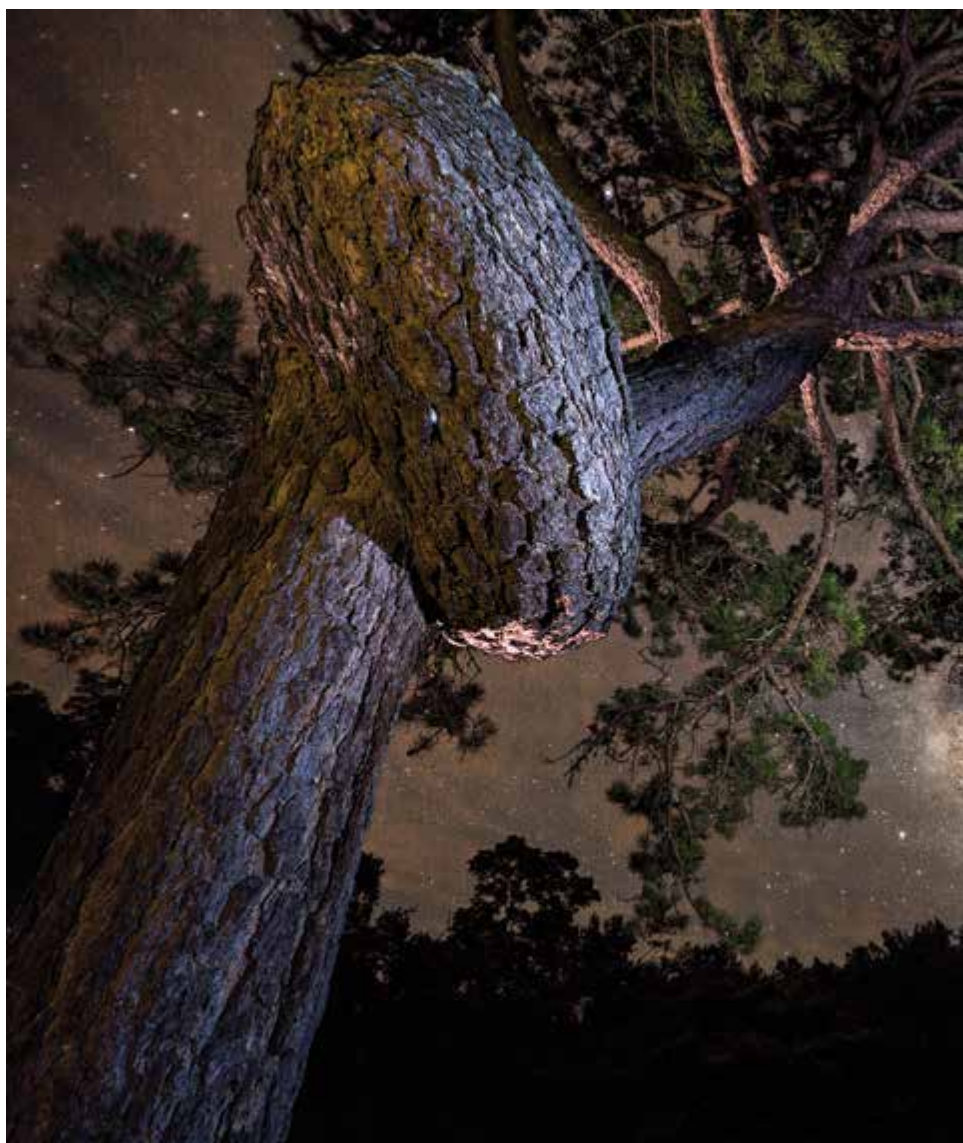
the time and date, and the stars are displayed and identified on a disk roughly as you would see them in the sky. There are also a number of smartphone apps that offer a graphic display of the stars in real time.

When heading out to enjoy nature at night, always remember to dress in plenty of layers on cooler nights, prepared for at least 10 degrees cooler than the forecasted low. Hat, gloves, and warm socks are also important. Be sure to give some time for your eyes to become adjusted to the dark. Using a red flashlight — either a red LED or a standard flashlight covered with red electrical tape — will help preserve your night vision.

And while you're out discovering the stars, why not explore the natural elements around you? The darkness makes one more attune to the howl of a coyote in the distance, the rustle of opossums skittering in the woods nearby, or the raucous calls of a pair of barred owls. The Missouri evening primrose opens its yellow petals after the sun goes down, welcoming a multitude of night-flying moths. There's really a lot happening in nature when we humans are usually sleeping.

The next time you want to experience Missouri outdoors in a different way, consider spending some time under the stars. Nature doesn't go to sleep after the sun sets. And you may find it gets even more interesting. ▲

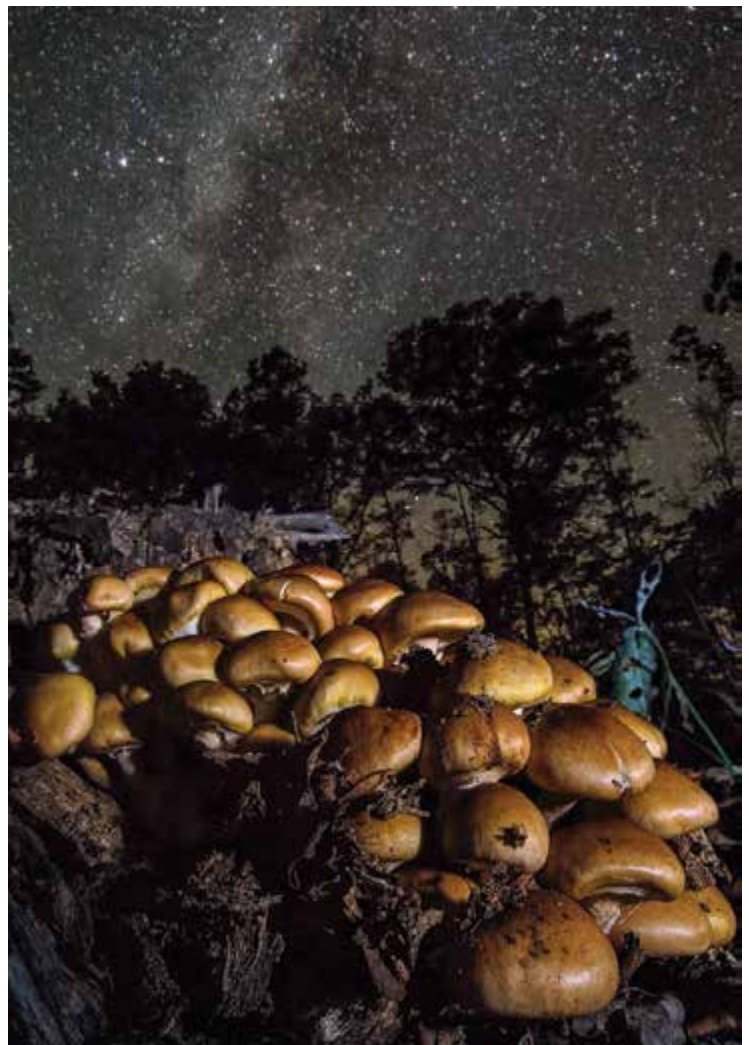
***Dan Zarlenga** is the Department's media specialist for the St. Louis Region and has been an amateur astronomy enthusiast for most of his life. When he took up an interest in photography six years ago, it seemed only natural to turn his camera to the stars. He especially enjoys the challenge of blending both elements of the night sky and land in his photos.*



**Twisted Tree,
Millstream Gardens
Conservation Area**

This unusual cedar has been the subject of many photos, but I wanted one at night. Sometimes you have to wait patiently for land and sky to line up in just the right way. The Milky Way was taken at 30 seconds, f/2.8, ISO 3200. The tree was six separate exposures light painted from different angles, 15 seconds each, f/8, ISO 200. Blending in Photoshop created dynamic lighting effects.





Mushrooms and Stars, Ozark Trail

This was a fun one taken during a backpack trip on the Ozark Trail. I used a Canon Powershot G16 advanced compact camera in manual mode. The background sky was 20 seconds at f/1.8, ISO 2000. The mushrooms were taken at f/4.5, ISO 80 and lit with my headlamp.



McBaine Bur Oak

This photograph was created using 34 images stacked at 60 seconds each, f/4, ISO 1000. This iconic state champion tree appears to sit a few feet off the road. Taillights from a passing car created a surreal highlight.

Coyotes

IN PHOTOGRAPHY, YOU don't always get the shot you planned, but if you keep your eyes open to other possibilities, you just might get a photo you didn't expect.

It was a few days into December at Squaw Creek National Wildlife Refuge near Mound City. Bitter winds and gray skies kept most of the wildlife hunkered down. The snow geese hadn't started their migration, and the mallards, gadwalls, and green-winged teal were too far into the wetland to photograph. A few bald eagles were present, but the weather wasn't miserable enough yet to force a big group of them down from the north.

The large herd of white-tailed deer I was in search of was not in the usual feeding spots, so I spent a couple of hours cruising, looking for something interesting. I was about to call the morning a bust and get some hot coffee when a beautiful coyote stepped out from behind a tussock of grass at the edge of a picked cornfield. I was so focused on spotting antlers in the distant woods across the field that I nearly overlooked this amazingly fine creature less than 50 yards from my pickup. He seemed utterly unconcerned about my presence and stood still, taking stock of the situation.

I shut off the engine to kill the vibrations and slowly pulled a 500mm f/4 lens from the passenger seat, resting it on the window of the truck for stability, and snapped a few photos. As the seconds ticked by, the coyote began to shift its weight from left to right, then slowly turned and trotted away. He stopped several times to glance back at me, almost posing, as I continued to photograph him. After he faded into the grass, I continued driving a few 100 yards down the road, content with what I had captured in the camera, when I encountered the coyote again, this time even closer. I fired off a few more frames as he slinked away into the cover of the wetland.

Because coyotes are nocturnal, I normally hear them yipping and howling at night. But I have seen them during the day, darting across the brushy-crop fields they frequent. It is rare that I have the chance to see them up close. This fellow was very healthy, with a luxurious winter coat. His vigor and unthreatened demeanor hinted that he ate well and didn't feel a lot of human pressure at the wildlife refuge.

I've learned over the years that most animals don't perceive vehicles as a serious threat, so enclosed cars and trucks work well as wildlife viewing blinds if the animal is within viewing distance from the road. The instant a car door is opened and you take a step out, however, chances are the animal will get spooked and disappear quickly. Sometimes keeping the door closed means awkwardly contorting your body to frame the photo or just missing the photo altogether and enjoying the moment.

—Story and photograph by David Stonner

📷 500mm lens • f/5.6 • 1/20 sec • ISO 160

We help people discover nature through our online field guide. Visit on.mo.gov/1M3cWgI to learn more about Missouri's plants and animals.





Nodaway Valley Conservation Area

Located in northwest Missouri along the banks of the Nodaway River, this area in Holt and Andrew counties is home to a wide variety of wetland plants and animals and many opportunities for outdoor recreation.

IN 1991, THE Department purchased 3,833 acres along the Nodaway River to restore a small portion of wetlands that once flourished in the floodplain. An additional 50 acres was added to the area in 2012 as a result of a donation by the estate of Kathleen Lance of Andrew County, bringing its total size to 3,883 acres.

A major wetland development project was completed on the area in 2002, thanks to contributions from public and private partners. This project included the construction of levees, water control structures, and two river pump stations. The improvements restored more than 2,000 acres of shallow wetland habitat in the Nodaway River floodplain.

A 4-mile stretch of the river flows through the area, providing habitat for both migratory and resident wildlife species. The area is managed primarily to provide floodplain and wetland habitat for a range of game and nongame wildlife, including waterfowl, migrating shorebirds, amphibians, reptiles, and many small game species. Area staff manipulates water levels in the wetland pools, providing habitat and food for migrating birds and other wildlife at different times of year. Other management practices include farming, controlled burning, and planting various bottomland hardwood tree species. A few hundred acres of restored prairie also exist on the area. These acres have been planted with native prairie plants and burned periodically to mimic historic processes.



70–200mm lens • f/8 • 1/200 sec • ISO 800 | by Noppadol Paothong

Waterfowl hunting is one of the most popular activities on the area. Waterfowl hunters arrive each morning of the season well before sunrise to try their luck at a drawing for available hunting spots, which include eight to 10 “wade-and-shoot” opportunities and four duck blinds. The area also has an open hunting area where waterfowl hunters can hunt without attending the daily drawing and one ADA-accessible blind available by reservation.

Waterfowl viewing is also popular at Nodaway Valley. Each spring and fall, thousands of ducks, geese, and other migrating water birds pass through the area. Many common birds, like mallards, snow geese, and red-winged blackbirds, visit the area in the tens of thousands. More uncommon birds, such as yellow-headed blackbirds, cinnamon teal, white-fronted geese, and bald eagles, have been spotted by dedicated or lucky viewers. The Audubon Society of Missouri bird checklist for the area can be found at mobirds.org/CACHE/AreaChecklist.aspx?site=20. Peak times for bird watching are November–December and February–March.

—Craig Crisler, area manager



Nodaway Valley Conservation Area

Recreation Opportunities: Hunting, fishing, birding, and wildlife viewing

Unique Features: Open marsh, seasonal wetlands, restored prairie, upland forest

For More Information: Call 660-446-3371 or visit mdc.mo.gov/a9134



MDC DISCOVER nature

To find more events near you, call your regional office (phone numbers on Page 3), or visit mdc.mo.gov and choose your region.

NATURE CRAFT NIGHT

DEC. 2 • WEDNESDAY • 6–8 P.M.

*Northeast Region, Northeast Regional Office,
3500 S. Baltimore, Kirksville, MO 63501
Registration required, call 660-785-2420
Families*

All materials and supplies will be provided to help create a special gift for family or feathered friend. Pinecones, sweet gum balls, or milkweed pods will be used to create a snowman, tree, owl, or a deer.

SQUIRREL HUNTING

DECEMBER 5 • SATURDAY • 7:30 A.M.–12 P.M.

*Ozark Region, Ozark Regional Office,
551 Joe Jones Blvd., West Plains, MO 65775
Registration required, call 417-255-9561
Ages 11–15*

Join us as we chase bushytails through the scenic Caney Mountain Conservation Area.

CONSERVATION TEEN CLUB — SHOOTING 22S

DEC. 5 • SATURDAY • 9 A.M.–NOON

*Southwest Region, Springfield Conservation
Nature Center, 4601 S. Nature Center Way,
Springfield, MO 65804
Registration required, call 417-888-4237
Ages 12–17*

Learn how to shoot 22-caliber rifles at the Andy Dalton Shooting Range at the Bois D'Arc Conservation Area. After classroom discussion, it's out to the range to practice and test your skills.

37TH ANNUAL EAGLE DAYS

DEC. 5 • SATURDAY • 9 A.M.–5 P.M.

DEC. 6 • SUNDAY • 10 A.M.–4 P.M.

*Northwest Region, Squaw Creek National
Wildlife Refuge, 25542 US-159,
Forest City, MO 64451*

*No registration required, call 660-442-3187
for more information*

All ages, families

Join us for the 37th Annual Eagle Days! The event will include driving tours of the refuge and Big Lake State Park, live eagle shows from Dickerson Park Zoo, exhibits, kids activities, and more.

GIGGING

DECEMBER 12 • SATURDAY • 4–10 P.M.

*Ozark Region, Twin Pines Conservation
Education Center, RT 1 Box 1998,
Winona, MO 65588*

*Registration required, call 573-325-1381
Ages 8–16*

Trade your rod and reel in for a gigging pole for a more challenging way to fish. We'll meet at Twin Pines and then head to the river for a gigging experience and fish fry.



BALD EAGLE: NOPPADOL PAOTHONG; FISH GIGGING: DAVID STONNER



IDEAS FOR FAMILY FUN



Bald eagle

NATURE CENTER AT NIGHT: CANDLELIT WOOD WALK

DEC. 17 • THURSDAY • 5–8 P.M.

*Southeast Region, Cape Girardeau
Conservation Nature Center, 2289 County
Park Drive, Cape Girardeau, MO 63701
No registration required, call 573-290-5218 for
information*

All ages, families

Enjoy the serenity of a winter night as you stroll along our trail. We'll light the path and provide hot beverages for your enjoyment. After your walk, stop inside the nature center to warm up and view our exhibits. Our trail is paved and accessible to wheelchairs and strollers. Youth and adult groups welcome.

HOLIDAY HAPPENINGS

**DEC. 29, 30, 31 • TUESDAY–THURSDAY •
10 A.M.–3 P.M.**

*Central Region, Runge Conservation Nature
Center, Hwy 179, Jefferson City, MO 65109
No registration required, call 573-522-5544
for more information*

All ages, families

Visiting with family and friends is an important part of the holidays. Many folks have made it a tradition to visit Runge Nature Center over the holiday to enjoy a variety of programs and activities. We hope you are one of them. If not, start your tradition this year.



Subscribe online • on.mo.gov/1E6osBA • Free to Missouri households



I Am Conservation

David and Melissa Sanford acquired Brush Creek Farm in 2009, and they have worked the past five years converting the land from overgrown fields of rank fescue, sericea lespedeza, and cedars to fields of abundant wildflowers, native warm-season grasses, and a 10-acre restored prairie. "We wanted a place to train our English springer field spaniels, to enjoy nature, and to learn about native plants," said Melissa Sanford. "We moved from a golf course community in Springfield and had no idea how to run a farm. We soon learned that land needs care and commitment." The couple contacted the Department's Private Land Services staff for assistance. The Department helped them develop a plan and assisted with restoring over 80 acres to native grasses and forbs. "It takes at least three years to reestablish warm-season grasses," said Melissa Sanford, "The first few years we had drought and lost them all. But we replanted, and now we have beautiful big bluestem, Indian grass, switch grass, and others. This year, some of it was 9 feet tall." The couple said they hope the land will serve as a legacy to their family and to fellow spaniel enthusiasts. "Upland bird hunting is a passion for many, and passing this on to our son and our grandchildren is so important to us both," said Melissa Sanford. "We are expecting our first grandchild in February, and he will be raised knowing the importance of upland bird hunting." —*photograph by Noppadol Paothong*